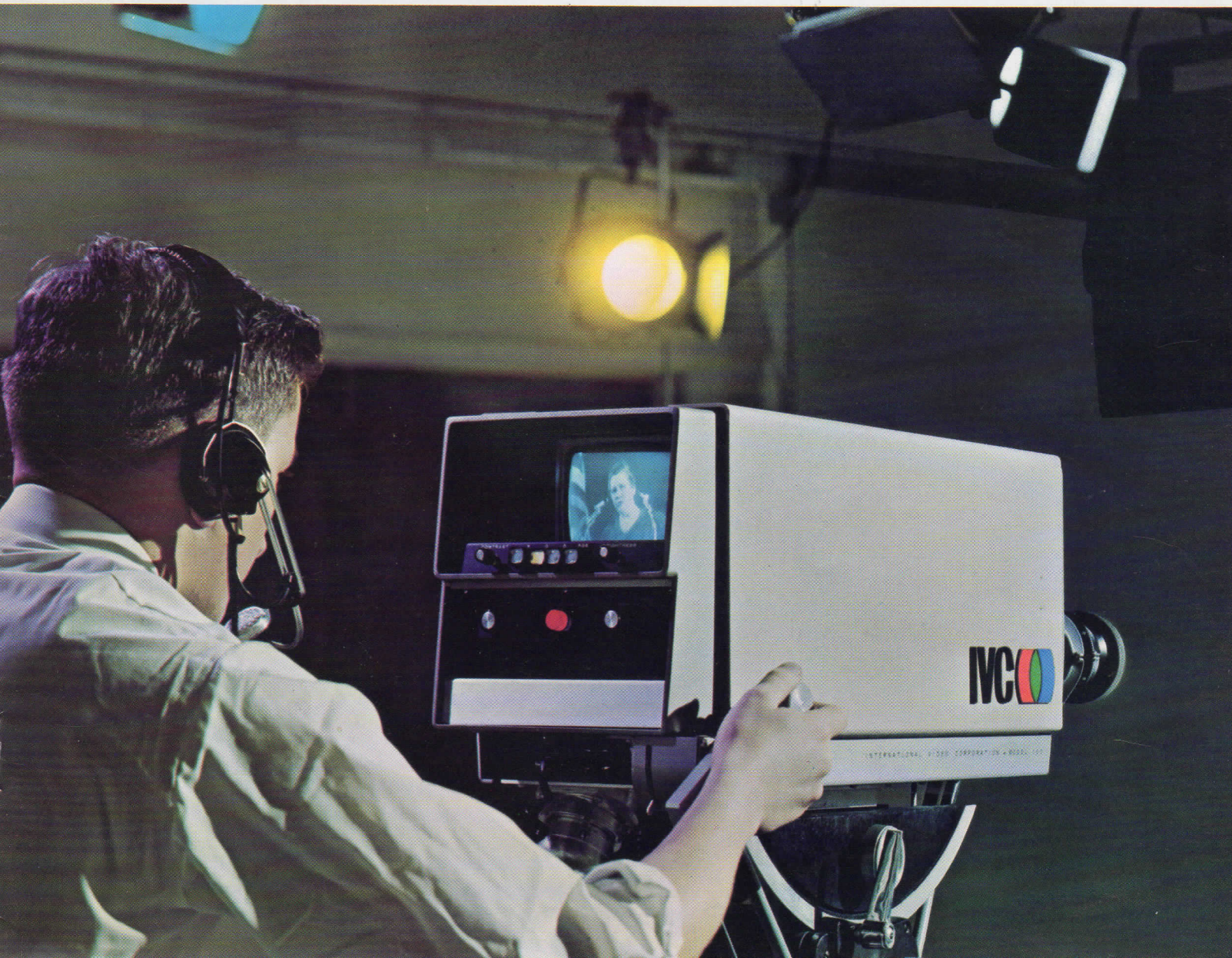
IVC

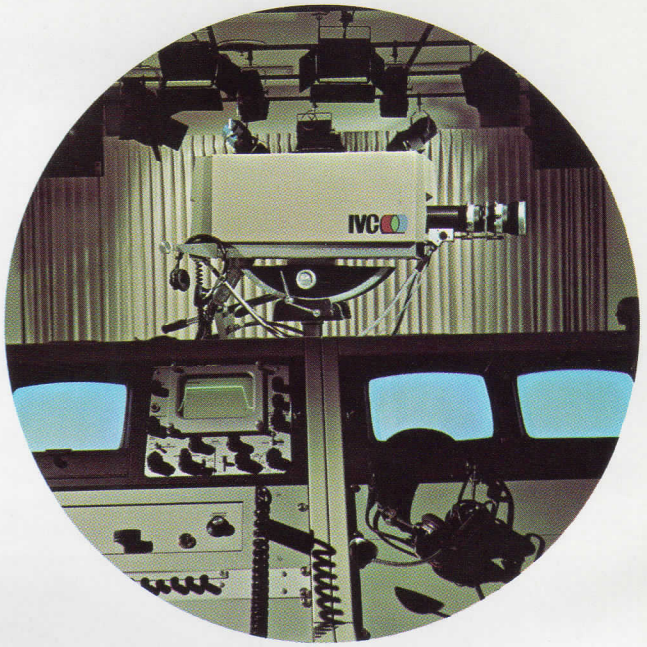
International Video Corporation

IVC-100

color cameras
for broadcasting,
cablecasting
and CCTV



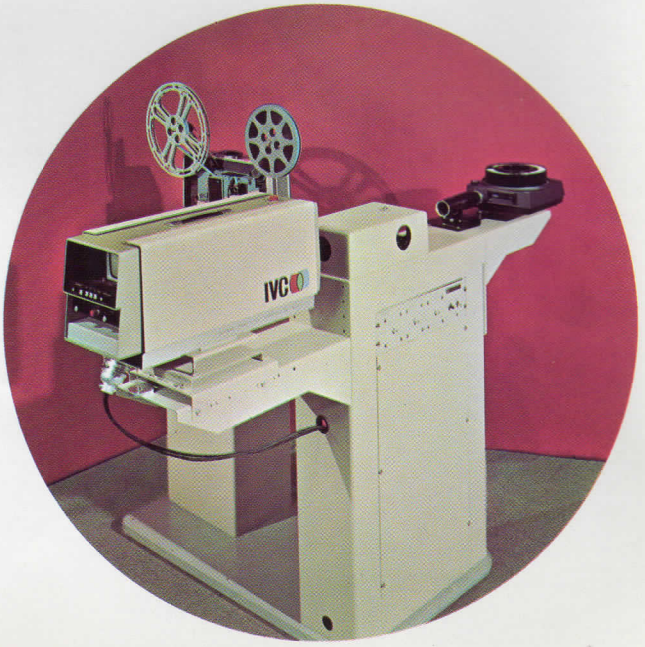
IVC-100 . . . An economic and technical breakthrough in color television



1



2



3

1 Broadcast version of IVC-100 has external encoder and sync generator. Camera junction units, remotes, picture and waveform monitors are located in control centers.

2 CATV, CCTV, ETV version of IVC-100 with internal encoder and sync generator. Pictured above with NTSC color monitor that can be operated directly by the camera.

3 IVC film chain incorporating IVC-110 film chain camera (or IVC-111 convertible camera), slide and film projectors.

For the first time since the birth of color television, small-to-medium sized broadcasters, cablecasters and CCTV users can NOW afford outstanding live color . . . can NOW cope with the technical aspects of color. Two significant breakthroughs — one economic, one technical — have resulted from IVC's unique approach to the design of a simplified, high-performance color camera.

Costing only one-third to one-fifth as much as standard studio cameras, the 3-vidicon IVC-100 produces full broadcast quality color at normal studio lighting levels (200–400 ft. candles) . . . and superb color under all conditions outdoors. Compared with color from highly regarded and more expensive studio cameras, IVC-100 color is subjectively the same. In some cases, colorimetry (as seen on home receiver screens) is even better!

Recently, the world's first local color cablecast was originated with an IVC-100 for the 10,000 subscriber Coachella Valley CATV system, Palm Desert, California. Cable management and subscribers alike were enthusiastic about the results. Color quality in cable homes was as good or better than anything previously rebroadcast from Los Angeles sources.

Those broadcasters and cablecasters who have used the IVC-100 are also delighted with its sheer simplicity. Having few more controls than found on many monochrome cameras, the IVC-100 is easily adapted into systems already capable of handling monochrome. Little training is needed to convert operating personnel to color; maintenance and adjustment for excellent color is minimal.

To see how the revolutionary IVC-100 works, turn to the technical descriptions on the following pages.

how the IVC-100 works

Optical system
The IVC-100's unique optical system is a major contributor to high camera performance at low cost. The complete optics (including vidicons) are mounted on a rigid bedplate. All elements are permanently fixed in optimum position at the factory (via sophisticated tooling) and require no adjustment for the life of the camera. The optical assembly is held in the camera by precision dowel pins; it can be removed in seconds to allow vidicon replacement without optical realignment.

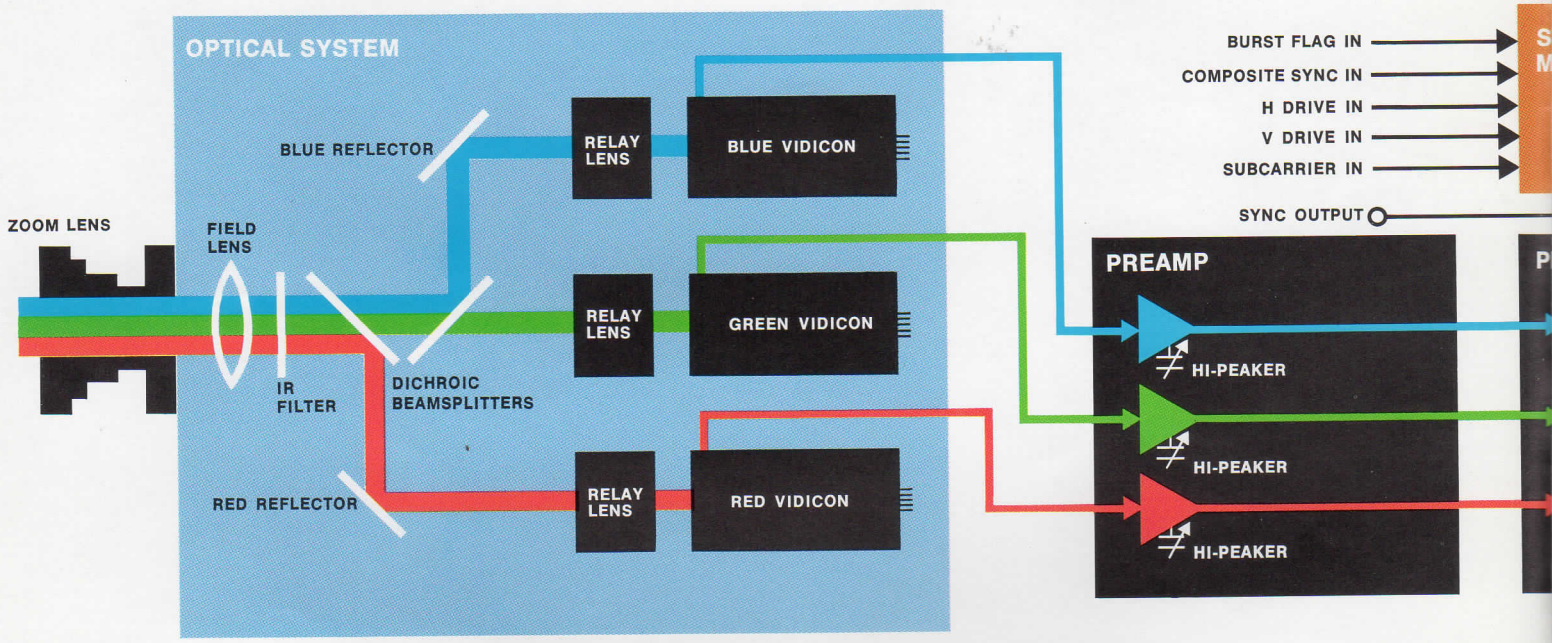
A carefully designed de-magnification (image reduction) that takes place in the IVC-100 optical system provides several advantages. First, it allows use of taking lenses in the popular single lens reflex (double frame 35mm) format. With over 700 single lens reflex designs listed in current catalogs, the user has a broad selection of excellent lenses to choose from. Second, since the taking lens' 43mm diagonal (very close to the image orthicon's 40mm diagonal format) is reduced to 0.625″ at the vidicon faceplate, a change occurs in the taking lens' f value and zoom range. They are altered by the 2.73:1 reduction in the direction of improved performance. For example, the lens normally supplied with the camera is an Auto-Nikkor f4.5, 50–300mm zoom lens. Used on the IVC-100, this lens provides a vidicon equivalent f value of 1.9, with an effective zoom range of 18.5 to 111mm.

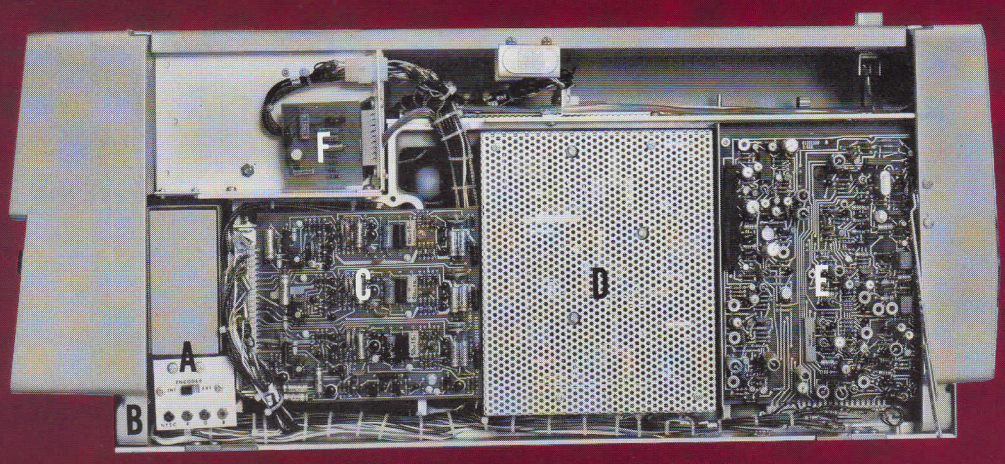
The light splitting functions of the optical system are fundamentally straightforward. A field lens transmits the taking image to two computer designed dichroic mirrors with very low hue shift. The first dichroic shunts red light only to the red reflector, relay lens and vidicon. Blue and green parts of the spectrum pass through to the second dichroic, where all blue light is shunted to the blue reflector, relay lens and vidicon. Green light passes through both dichroics directly to the green relay lens and vidicon.

The carefully chosen colorimetric response of all elements in the IVC-100 optical system allows very close compliance to nominal NTSC taking characteristics — without the use of lossy trimming filters. These characteristics of the IVC optical system contribute significantly to overall camera sensitivity and color fidelity.

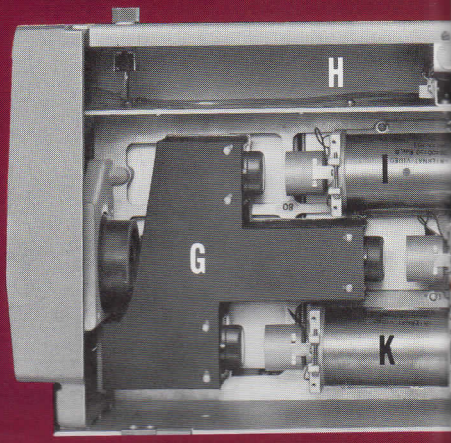
Electronics
All IVC-100 camera electronics are self-contained in the camera head — even including an internal color encoder on the CCTV version. All circuit boards in the camera are plug-in modules that can easily be replaced should a fault develop.

One circuit module in the camera head contains three identical preamps to increase R, G and B vidicon signals to a usable level. This module also corrects signals for frequency roll-off created by stray capacitances at the preamp input. Amplified and corrected signals are next routed to an R, G and B processing amplifier module where gain and black level can be adjusted. An adjustable white clipper on this module per-





RIGHT SIDE



LEFT SIDE

mits cutting off of extreme white highlights at a preselected level. Source terminated outputs from the proc amp module (as well as output from the camera's internal sync generator) are available on the rear bottom of the camera for an RGB color monitor. Outputs from the proc amp module are also routed to the camera's built-in viewfinder for display of either Red, Green or Blue signals — or any combination of all three.

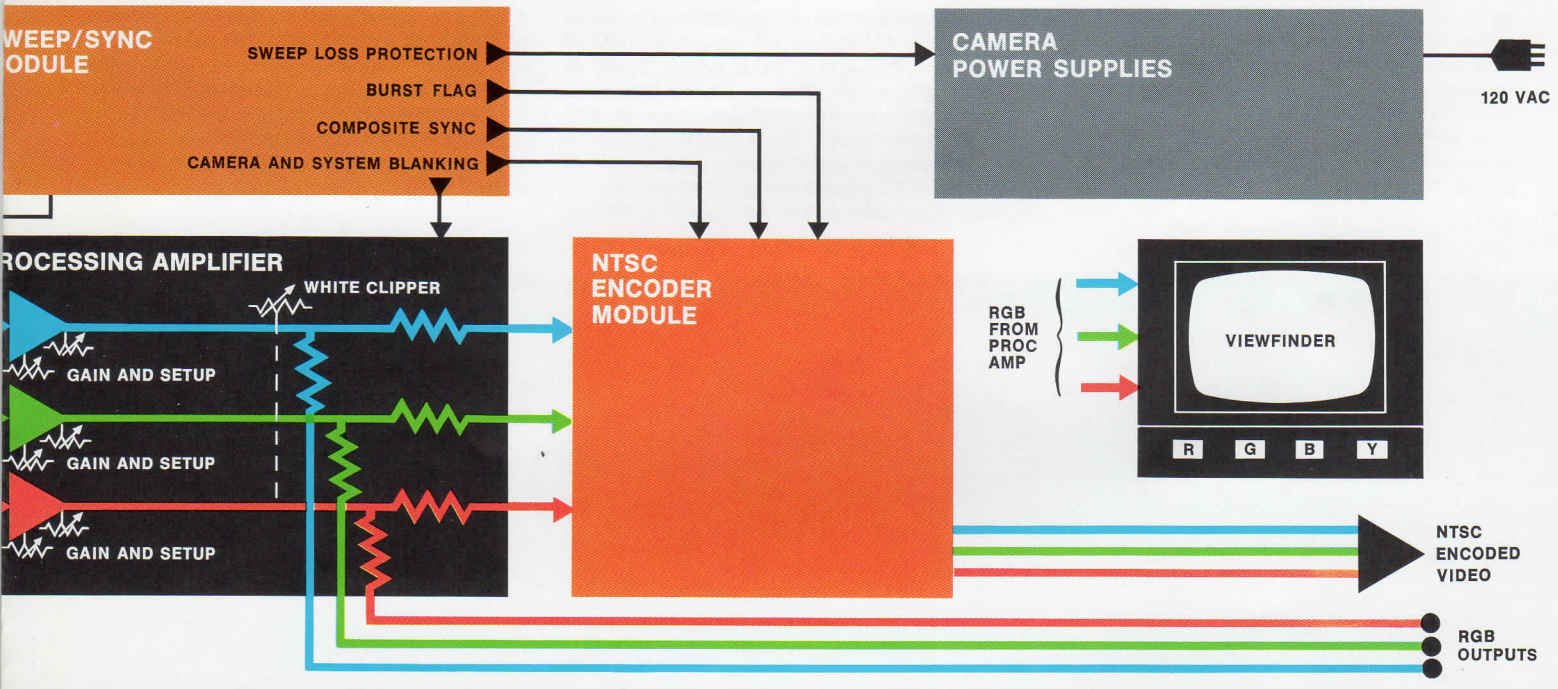
Two other modules in the camera generate sweep/sync signals and all necessary power for internal camera circuitry. The sweep sync module provides vidicon horizontal and vertical sweep; it has its own integrated circuit, 2 to 1 interlaced sync generator operating from a 31.47kHz crystal oscillator. Ultimately, mixed blanking and mixed sync are derived from this module, as well as burst flag required by the NTSC encoder module. If desired, an optional EIA sync generator can be plugged into a card slot provided on the top of the electronics compartment; EIA synchronized output has full frequency interlace and complete EIA RS-170 waveform.

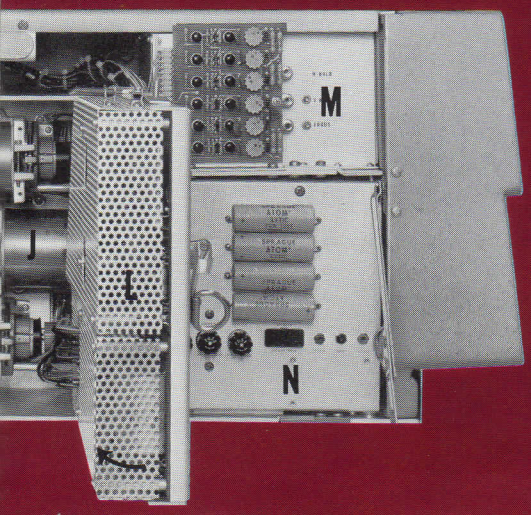
In the CCTV version of the IVC-100, R, G and B proc amp signals are next routed to a plug-in NTSC encoder. This module is built on a compact (6″ x 7″), double-sided, printed circuit board. It incorporates its own 3.58MHz oscillator for derivation of color burst (on the horizontal back porch) and chrominance information. Use of the internal encoder greatly simplifies operation of the camera in CATV and CCTV applications. The only camera connections needed are: (1) a single coax for NTSC encoded output, (2) 120V input power cord.

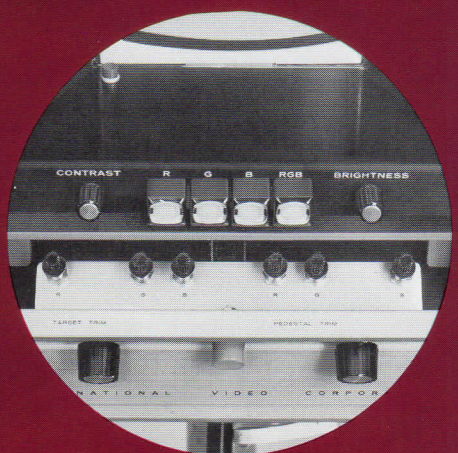
In a broadcast studio, the IVC-100's internal encoder board is normally removed. A switch inside the "electronics door" is thrown to the EXTERNAL SYNC position, readying the camera for operation with a studio master sync generator. External sync allows smooth switching and fading between several IVC-100s. Another switch in the camera (EXTERNAL ENCODE) is also thrown; it allows operation of the camera from an external, broadcast-type encoder. The broadcast version of the camera is supplied with a camera remote; it allows control room camera adjustment.

Operation

The IVC-100 is extremely easy to use. Its compactness and light weight (only 65 pounds, including lens) allow a single operator to readily move it about, lift it onto tripods, etc. Light weight also permits use of smaller, less cumbersome tripods. The built-in camera viewfinder has a bright, five-inch picture for rapid, accurate picture framing. An easy-to-reach control panel, directly beneath the viewfinder, allows the operator to adjust camera master gain and pedestal — also, when this panel is swung out, to trim R, G and B target and pedestal. A row of optional pushbuttons and indicator lights below the camera control panel also allows the cameraman to operate a remote IVC video recorder from his normal operating position; this feature conserves manpower in recording situations. An optional intercom module (plugs into right side of the camera) terminates in a jack on the rear of the camera; it connects the cameraman with the control room via standard Western Electric headset. Two tally lights are incorporated in the standard camera; one is on the top for studio personnel, another inside the viewfinder hood for the cameraman.







REAR VIEW

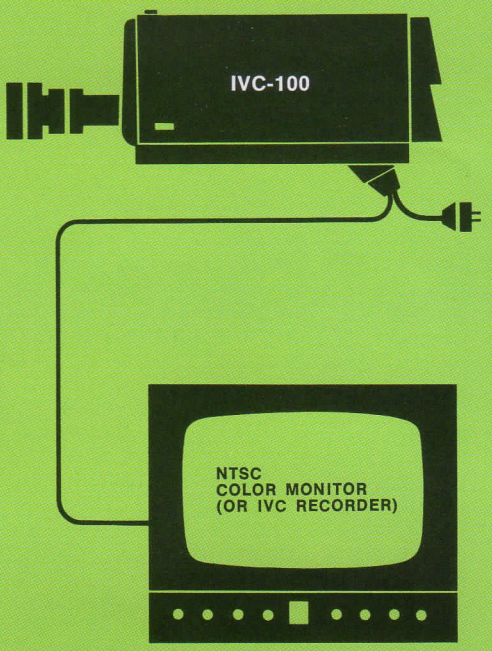
RIGHT VIEW: IVC-100 electronics compartment. (A) internal/external sync selector switch, (B) source terminated outputs for camera sync and RGB signals, (C) processing amplifier module, (D) preamp module, (E) internal NTSC encoder module for CCTV version, (F) intercom module.

LEFT VIEW: IVC-100 optical/adjustments compartment. (G) optical enclosure, (H) plug-in slot for optional EIA sync generator, (I) blue vidicon, (J) green vidicon, (K) red vidicon, (L) swing-out panel with set-up adjustments, (M) viewfinder adjustments, (N) utility outlet.

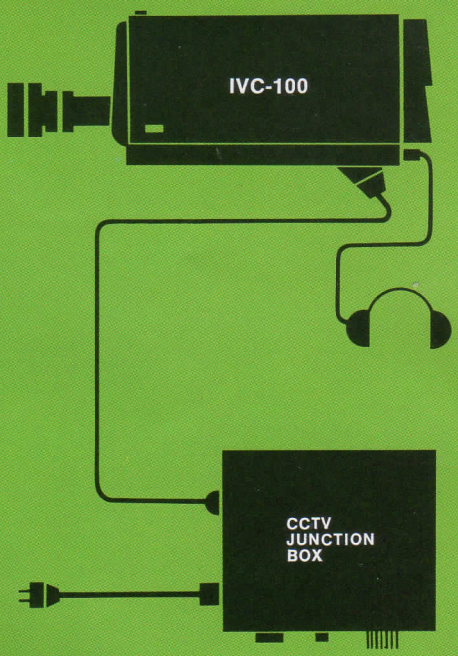
REAR VIEW: shows viewfinder controls, tally light and the R, G and B trimmer controls available when the control panel is swung out.

IVC-100 a camera of many faces

Versatile circuitry and flexible input/output arrangements make the IVC-100 a camera of many faces. It can be used just as easily and successfully in a simple CCTV system as in the most complex broadcast studio — with superb color or monochrome performance in both. Several IVC-100 camera options are described at the right.



The simplest and least expensive method of using the IVC-100 utilizes the camera's built-in sync generator and NTSC encoder. Using only two cables out of the camera's 50-pin Cannon connector (an RG-59U coax and 120VAC power cord), the camera can be operated directly into color monitors accepting NTSC signals — or directly into the IVC-810 color recorder.



A more versatile way to interconnecting the IVC-100 with a CCTV or CATV system makes use of the IVC JB-1002 Junction Box. Camera and junction box are interconnected with a 19-conductor cable. The junction box provides camera input power and outputs for: intercom party line, NTSC video, remote control of the IVC-810 recorder.

IVC-100 camera specifications

For detailed information on camera accessories, junctions, remotes, film chain — see separate IVC product sheets.

GENERAL INFORMATION

Type of reproduction: color and monochrome
Scanning standards: 525 lines, 60 fields, 30 frames
Aspect ratio: 3:4
Pickup tube complement: three IVC-4543 separate mesh, 90mA heater vidicons
Viewfinder size: 5″ diagonal rectangular
Taking lens: 18–110mm, fl.9 (vidicon equivalent) Nikkor 6:1 zoom is standard. Other lenses from 10mm to 200mm in fixed focal length; f2.0 Varotal 10:1 zoom available on special order.

VIDEO

Video output: 0.7V non-composite, 1.0V composite
Cable version output: sync in accordance with EIA RS-330 plus color burst; encoded signal fully NTSC compatible
Broadcast version output: signals fully compatible with EIA and FCC requirements
Sensitivity: color reproduction holds to 40 ft. candles; studio-quality pictures to 200 ft. candles
Resolution (luminance signal): 35% response at 400 lines with no aperture correction; limiting resolution is 500 lines center, 400 lines in corners
Aperture correction: 0–10dB adjustable
Window signal tilt: less than 2% horizontal and vertical
Geometric distortion: less than 1% within circle having a diameter equal to picture height; less than 2% elsewhere
On-axis linearity: 1%
Registration error: less than 0.15% within a circle whose diameter is 80% of picture height
Gamma: 0.65
Gray scale: 10 steps on EIA chart

OPERATIONAL

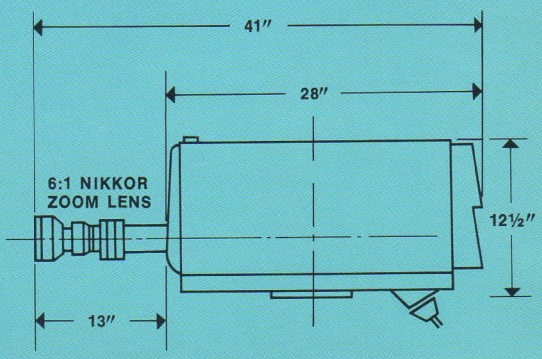
External controls: on/off; master gain; master pedestal; focus; zoom; iris
Controls under rear panel: R, G and B gain and pedestal trim
Remote controls (broadcast version): on/off; master gain; master pedestal; R, G and B gain and pedestal trim; R and B vertical and horizontal centering
Viewfinder controls: contrast; brightness; pushbuttons providing R, G or B display (any combination) or Y (a combination of all three); H-hold; V-hold; focus
Intercom: party line with anti-side tone and gain (at each headset); Western Electric or equivalent headset
Tally lights: top of camera and inside viewfinder hood; tally outlet provided on remote control

POWER

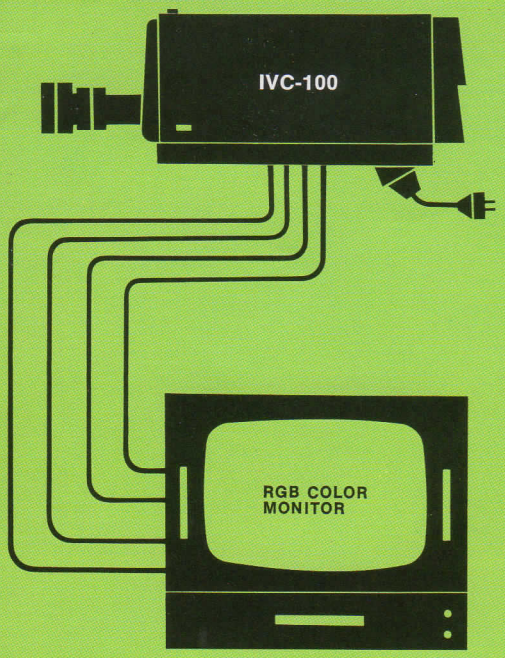
Input voltages: 120VAC, ±10%, 60Hz
Input power: 75 watts

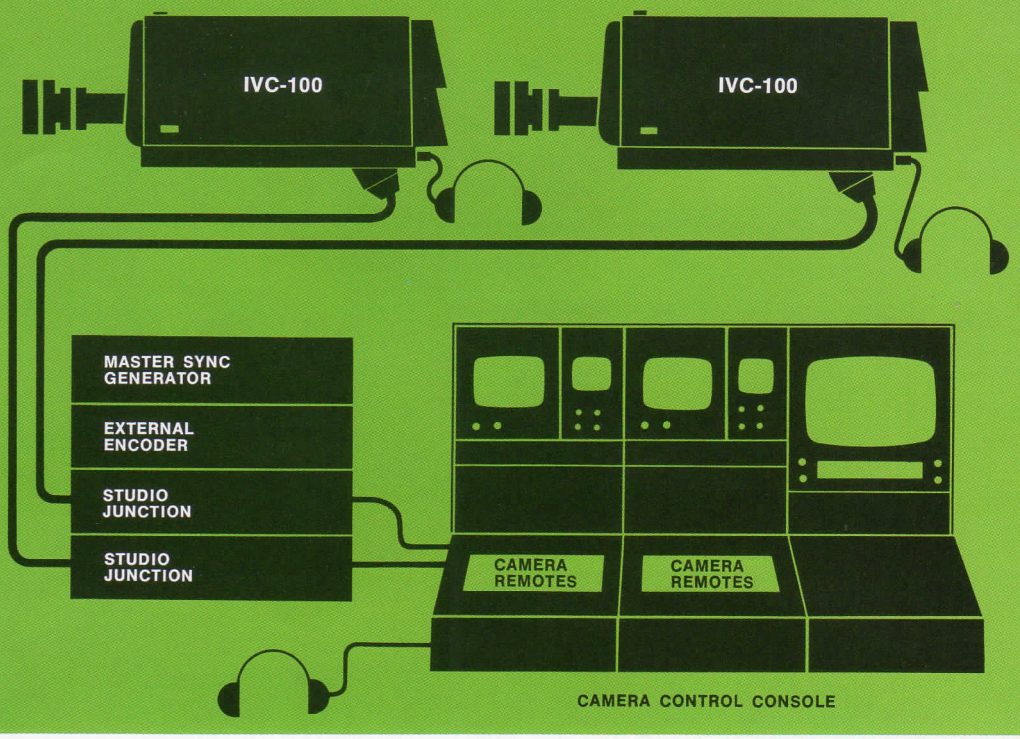
Specifications subject to change without notice or obligation.

DIMENSIONS



WIDTH IS 10″

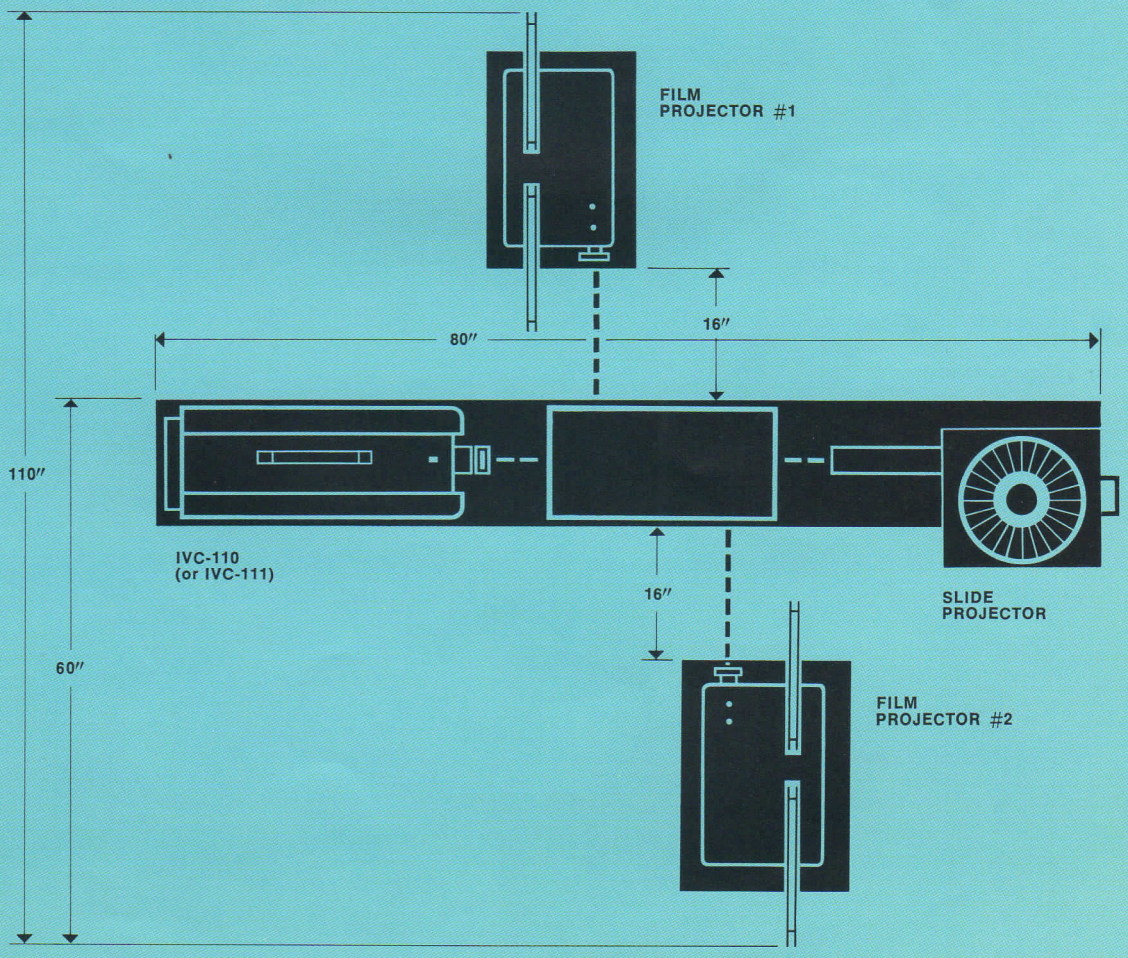


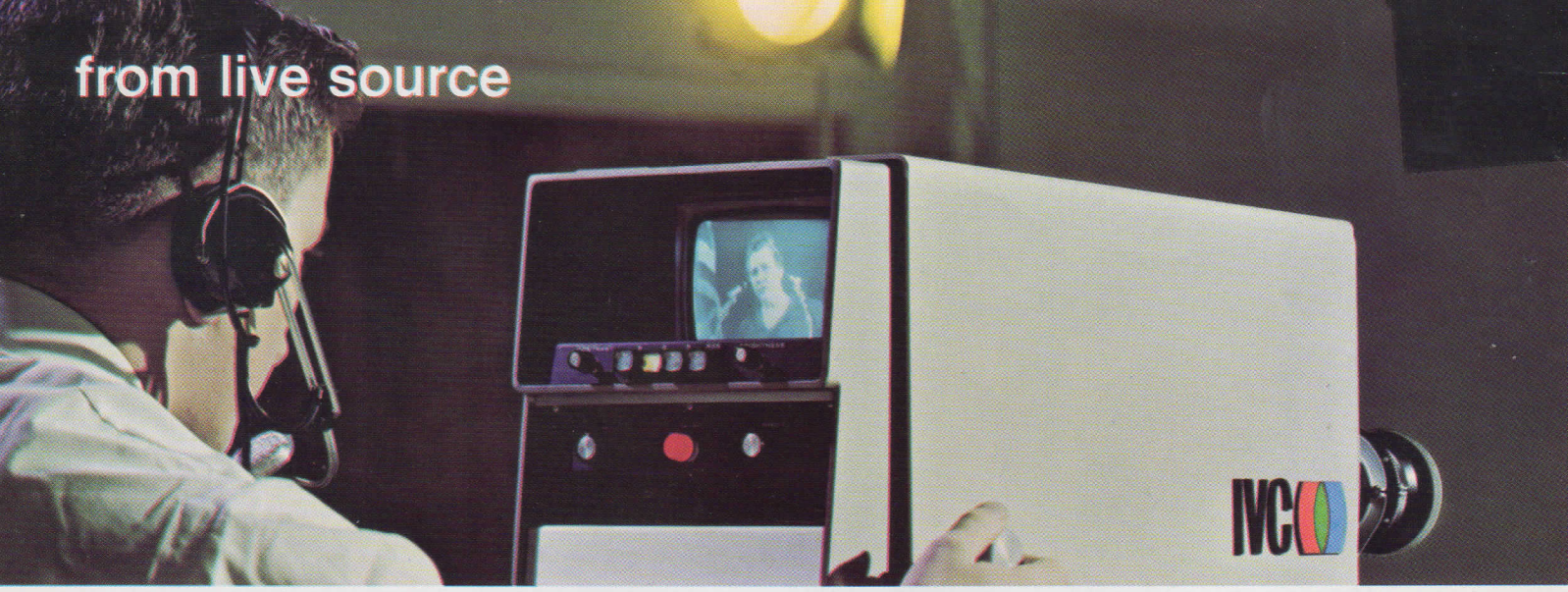


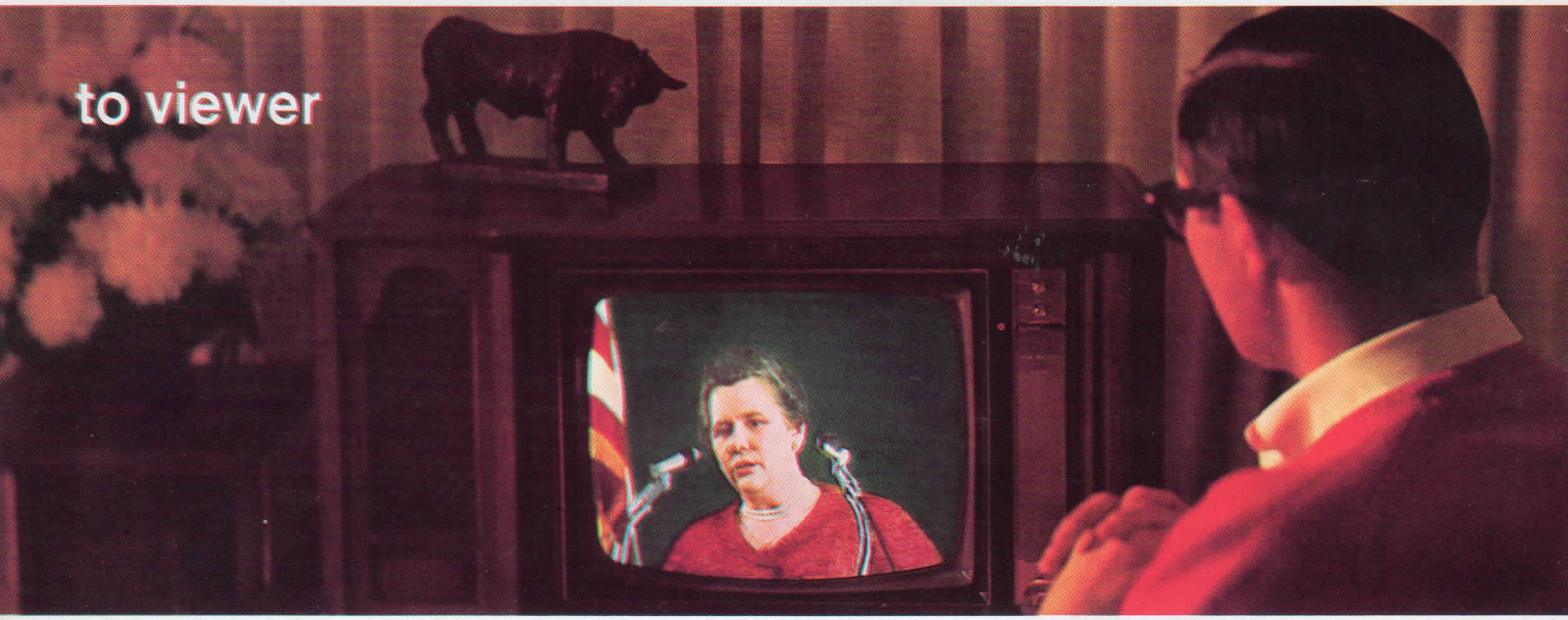
For the highest quality monitor pictures from the IVC-100, the NTSC encoder is bypassed. Direct, source terminated outputs from the camera's RGB proc amp (plus internal sync) are routed over separate RG-59U coaxial cables to separate inputs on a professional RGB color monitor.

In broadcast stations or sophisticated CATV or CCTV studios, the IVC-100 is interfaced to the system via a 50-conductor camera cable and IVC JB-1001 Studio Junction Unit. One camera is connected to each studio junction — which is in turn interconnected to the studio's master sync generator, external color encoder and power line. Remote controls for each camera are routed (on 33-conductor cables) from each JB-1001 to an IVC RC-1001 Camera Control Panel in the studio's camera control center. Intercoms are interconnected with the control room on a party line; each headset location has its own amplifier with gain and anti-side tone controls. The headset is split so program or cue audio can be heard, in addition to the party line.

IVC-100 film chain dimensions







whether color is broadcast, cablecast or recorded — pictures from the IVC-100 are subjectively the same as those originated from cameras costing many times more.
No other camera available today can match IVC's performance/cost combination in color cameras.

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